

**THE EFFECTIVENESS OF THE “MATO-OPUT 5” CURRICULUM  
IN CHANGING SCHOOL CHILDREN’S ATTITUDES TOWARDS  
CONFLICT AND VIOLENCE, AND IN REDUCING PUPIL  
PERPETRATED ACTS OF VIOLENCE**

**By: Milton Mutto  
Student Number: 0417597W**

**Supervisors: Dr Kathleen Kahn, Senior lecturer SPH**

**A Research Report submitted to the School of Public Health, Faculty of Health Sciences in partial fulfilment of the requirement for the award of a Master of Science in Medicine in the field of Epidemiology with Biostatistics degree of the University of the Witwatersrand.**

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## **I. DECLARATION**

I, MUTTO MILTON (STUDENT NUMBER 0417597W) hereby declare that this Research Report is my own work, and that I am submitting it for the award of the degree of Master of Science in Medicine in the field of Epidemiology with Biostatistics of the School of Public Health, of the Faculty of Health Sciences, of the University of the Witwatersrand-Johannesburg. This report has never been submitted for any other degree award or examination at this or any other University.

**NAME: MILTON MUTTO**

**SIGNED**-----

**DATE**-----

## **II.**

## **DEDICATION**

I wish to dedicate this report to my parents Grace and Naphtal (RIP) Driliga who have been a great inspiration to me; my wife Agnes, son Paul, daughter Hope, sister Eunice, brothers Richard, Michael, Charles, and Moses who supported and encouraged me through the twelve months of my studies at the University of the Witwatersrand.

### **III. ABSTRACT**

#### ***Objectives***

The study evaluated the effectiveness of the “Mato-Oput 5” curriculum in changing children’s attitudes towards conflict and violence and preventing violent acts by them; specifically, it determined attitudes differences between children exposed to and those not exposed to the intervention, and compared rates and trends of pupil-perpetrated intentional (violent) and severe intentional incidents among the children who were taught and those were not taught the curriculum.

#### ***Methods and setting***

The study was analysis of secondary data from a community trial. The original study had been conducted in a war affected rural district in Northern Uganda in 2002.

#### ***Results***

The intervention and control groups had comparable demographic characteristics, attitudes towards conflicts and violence, and rates of intentional and severe intentional incidents (violence) before intervention. After intervention, they remained comparable with regard to their demographic characteristics and rates and trends of intentional and severe intentional incidents. Their attitudes towards conflicts and violence, however, differed significantly, with the intervention group tending towards forgiving of offenders, and away from forceful response to provocation more than the control group. Both groups had post-intervention rate reductions in intentional incidents, and rate increments in severe intentional incidents. The pre-intervention incident rates in the intervention and control groups were 270/1000 and 370/1000 respectively, while the post-intervention rates were 190/1000 and 350/1000 respectively. Before intervention, seven in every 1000 incidents in the intervention group required school first aid or treatment in a health facility (severe incidents) as compared to 12 in every 1000 in the control group. These rates increased to 150/1000 and 160/1000 respectively after intervention.

#### ***Conclusions***

The Mato-Oput 5 curriculum was effective in changing children’s attitudes towards conflict and violence: the intervention group tended towards forgiveness of offenders

and non-forceful responses to provocation more than the control group. The rates and trends of pupil-perpetrated intentional (violent) and severe intentional incidents in the two groups of children, however, remained comparable.

#### **IV. ACKNOWLEDGEMENTS**

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## **VIII.**

## **NOMENCLATURE**

Act of violence: an incident of violence

Severe acts of violence: incidents of violence that warrant school first aid or treatment in a health facility

CDC: Centers for Disease Control and Prevention

CNIS: Canadian Network for International Surgery

Conflict: A situation in which people, groups or countries are involved in a serious disagreement or argument<sup>1</sup>.

ICC-U: Injury Control Center-Uganda

Mato-Oput: The name (title) of the curriculum under <sup>2</sup>. This name is derived from the cultural ritual performed for reconciling disagreeing parties among the Acholi people of Northern Uganda

Violence: Intentional use of physical force or power, threatened or actual against self, another person or group or community that either results in or has a high likelihood of resulting into injury, psychological harm, mal-development or deprivation<sup>3</sup>

WHO: World Health Organization

WHA: World Health Assembly

Youth violence: Violence involving children, adolescents, and young adults between the ages of 10 and 24 years, with the young person either victim or perpetrator, or both. It includes aggressive behaviours like; verbal-abuse, bullying, hitting, slapping, and fist fighting that do not result in serious injuries or deaths. Also included are serious violent and delinquent acts like aggravated assault, robbery, rape, and homicide, committed by or against youth.<sup>4</sup>

## **IX.**

## **PREFACE**

Youth violence is an important cause of the global problem of premature death, injury and disability. Growing concern for the problem has motivated the current global interest in it. The lack of effective prevention strategies, however, continues to hamper progress in prevention and control. Many of the risk factors for youth violence are known; but their control remains a challenge.

There is hope that the public health principles that successfully controlled communicable diseases in the past will provide solutions to the problem of youth violence as well. The search for interventions needs to be intensified, if its human, social, and economic toll is to be reduced. Primary level interventions need to be prioritised, although the secondary and tertiary interventions also need to be appropriately handled as well.

Schools-based educational interventions hold a lot of promise, offering real opportunity for rapid dissemination and hope for a major reduction in violence. Their potential to influence children in mass with minimal addition of resources needs to be exploited. Formalizing them through the school system will ensure sustainability, exploiting some of the benefits of increased access to education because of the universal primary education policy currently running in Uganda and other countries.

## **1.0 INTRODUCTION**

### **1.1 Background**

Youth violence is a big problem in Uganda today. Although many other individual, family, and community levels factors may have contributed, the country's violent past seems to have had the greatest effect. The Northern region of the country was most affected, having had war for 20 years. The, once prosperous, region was reduced to poverty and dependency on relief aid, with the bulk of its population internally displaced; the 1999/2000 National Household Survey, found it poorest, with 60% of its population below the poverty line compared to Western (43%), Eastern (54%) and Central (26%) regions and the National average of 35%<sup>5</sup>.

The childhood population was most affected, having been specifically targeted for: conscription into rebel ranks, marriage, and domestic labour. One report showed children as young as four years being involved with the rebels<sup>6</sup>, 90% of whom, themselves, were also children between 13-16 years of age<sup>7</sup>. Many of the children were compelled to join because of the need for food, shelter and medical attention, while others were abducted from schools or villages at gunpoint. By 1998, as many as 8 000 children had been abducted, and trained as rebel fighters, and many of them had been forced to commit brutal crimes and ritual killings, sometimes, of their own families<sup>8</sup>.

The children were, therefore, denied normal childhoods in environments of peace; many of them lived under very poor conditions and slept in bushes, church or hospital compounds on daily bases to avoid abduction. Consequently, there was a five to ten fold increase in childhood mortality in the region well a above the national expectation<sup>9</sup>, and

violence was entrenched as the norm, as many of the children had grown up seeing it as the acceptable method for resolving conflicts<sup>10</sup>

## **1.2 Literature review**

### **1.2.1 The scope and magnitude of the problem**

Violence is a global phenomenon: it has devastated whole economies, robbed people of livelihoods, damaged infrastructure, and crippled health care, welfare and education systems around the world<sup>11</sup>; causing diversion of resources from essential services to the military<sup>11</sup>. Youth violence, one of its most visible forms, continues to afflict thousands of ordinary people around the world daily<sup>3</sup>.

In 1996, the World Health Assembly declared (WHA resolution 49.25 of 1996) violence a major public health problem, and urged member countries to initiate public health activities to increase awareness of the problem within their national borders<sup>3</sup>. In 2003, in pursuit of the recommendations of the World report on violence and health, the WHO (Resolution 56.24) resolved to: create, implement and monitor national action plans for violence prevention; enhance capacity for collecting data on violence; define priorities for, and support research on, the causes, consequences, costs and prevention of violence; promote primary prevention responses; strengthen responses for victims of violence; integrate violence prevention into social and educational policies, and promote gender and social equality; increase collaboration and exchange of information on violence prevention; promote and monitor adherence to international treaties, laws and other mechanisms to protect human rights; and seek practical, internationally agreed responses to the global drugs and arms trades<sup>12</sup>.

In 2004, the African Union (AU) adopted the World report on Violence and Health in entirety, and declared 2005 African year of violence prevention<sup>13</sup>. Eight years after resolution 49.25, the problem rages as effective interventions continue to elude researchers: by 2000, its global toll had reached an estimated 1.5 million annual deaths; half of them suicides, one third of them homicides and one fifth war related<sup>3</sup>. Approximately 38% (199,000) of the homicides were due to youth violence, an equivalent of 565 daily deaths in the age group 10-29 years, each death being associated with 20-40 other non-fatal injuries requiring hospital treatment<sup>3</sup>. The youth violence death rates varied from 0.9/100,000/year in the developed countries to 17.6/100,000/year and 36.4/100,000/year in Africa and Latin America respectively<sup>3</sup>.

Youth violence is a complex problem. A myriad of individual, relationship, community and structural factors take responsibility for its occurrence, including: history of aggression, impulsiveness, harsh punitive discipline, poor monitoring and supervision of children, association with delinquent peers, witnessing violence, drug trafficking, access to fire arms, exposure to norms that support violence as a way of resolving conflicts and gender and income inequalities<sup>3</sup>. Youth violence includes gang violence and bullying in schools.

There is a close association between youth violence and other forms of violence like physical abuse and armed conflict, prolonged exposure to which has been shown to condition children to regard it as an acceptable means of resolving conflicts<sup>14, 15</sup>. Although the global trend of youth violence is not clear, many countries have reported upsurges<sup>16</sup>, with decreasing mean ages of perpetrators, as more and more children are getting involved in violent crimes<sup>17</sup>. In America, for example, majority of the violent

crimes committed during the last half century were found to have been committed by adolescents and young adults<sup>18</sup>.

### **1.2.2 Risk factors for youth violence**

A number of factors operating at individual, interpersonal, community and society levels are responsible for the occurrence of youth violence. Individual level factors include biological, psychological and behavioral characteristics; interpersonal level factors include relationships within family, friends and peers; community level factors include rural-urban differences, presence of gangs, guns and drugs, and the degree of social integration in a community; and society level factors include laws, policies, ideologies, and social conditions that create environments supportive of violence among young people. Also included here are rapid socio-demographic changes that lower real wages; weaken labor protection, infrastructure and access to social services; poverty; income inequalities; quality of governance; and cultural influences<sup>3</sup>.

### **1.2.3 The role of armed conflicts**

Armed conflicts have a particularly negative effect on young people. Apart from the heightened risks of injury, infection with diseases like malaria and HIV/AIDS<sup>19</sup>, and long term psycho-social and physical problems like post-traumatic stress disorders (PTSD)<sup>20</sup>, armed conflicts impose other socio-economic and cultural problems. Firstly, young people are usually the largest group of participants and victims of conflicts: being cognitively immature and unable to fully evaluate their actions, they are usually manipulated into participating in atrocious acts at war fronts, acts known to have negative long-term psychosocial effects<sup>21</sup>. Secondly, by disrupting productivity, service

delivery, and social order, armed conflicts create conditions that promote violence by them.

Africa has particularly been prone to war: in the 1980s and early '90s alone, for example, 35 countries on the continent had wars that directly or indirectly affected over 550 million people; caused an estimated 5 million excess deaths, and at least US \$13 billion in annual economic losses<sup>15</sup>. Up to 70% of health networks in some of the countries, were destroyed<sup>16</sup>, further compromising response capacities in them and worsening their risks of malnutrition and deficiencies<sup>17</sup>. Violence was entrenched as the norm, a culture that continues to torment some of the countries even today.

#### **1.2.4 Youth violence prevention**

The problem of youth violence has continued to perturb researchers across the globe: the lack of effective preventive strategies, systems and services is partly responsible for its persistence. The requisite systems and services include those that target the less obvious risk factors such as; pre-, ante- and post-natal care, day care for children, social support and skill training for new parents, welfare for impoverished families, access to school, and employment opportunities. A number of interventions are currently being implemented in different parts of the world, most of them are not, however, tested, many are based on questionable assumptions and many are delivered with little consistency or quality control<sup>3</sup>. Others are being evaluated<sup>24-30</sup>.

A number of paradigms have been used to conceptualise youth violence: among them, social learning, attribution, resilience, and developmental theories<sup>31</sup>. Social learning

theory focuses on the reciprocal relationships between the environment, and behaviour, and the internal mediating variables. It looks at behaviour as an outcome of anticipated response consequences, with people as learning by observing, besides participation. People, according to the theory, are more likely to model behaviours of those they identify with in their environment<sup>32</sup>. It looks at violence as learned and modelled, with parents and people in the social environment greatly influencing the young people, who simply observe and model what they see, including the violence in the media. It prescribes training and introduction of alternative models as ways of helping young people evaluate poor models around them<sup>30</sup>. It also looks at perceptions and attitudes towards the environment as a significant influence on behaviour<sup>33</sup>.

Attribution theory looks at youth violence as a consequence of faulty attributions of cruelty or malevolent intentions by the young people to others. The assumption here is that people act on the bases of their beliefs, regardless of whether or not the beliefs are valid<sup>34</sup>. It prescribes; training young people to rethink situations that lead to faulty attributions, and helping them see diversity as advantageous and a source of strength<sup>35</sup>.

Resilience theory posits existence of protective factors, mostly environmental, which insulate children from surrounding violence. This model is based on the observation that not all children raised in impoverished and violent neighbourhoods turn out to be so. Among factors thought to be protective are: involvement in productive and meaningful activities, presence of one or more supportive adults, and higher expectations of the people around the child. It recommends environmental changes in ways that maximise the protective factors<sup>36</sup>.

Developmental theory focuses on human interpersonal and socio-cognitive developmental process and looks at aggressive behaviour as an outcome of this process. It prescribes specific programs aimed at altering maladaptive behaviours as a prevention strategy<sup>37</sup>. A fifth theory, an eclectic approach is emerging: it supports flexibility in approaching youth violence, borrowing elements from the other paradigms as occasioned by a situation<sup>31</sup>.

Regardless of paradigm, violence is a behavioural problem; behaviour change is required if it is to be controlled. Although varying in strategy and foci (primary, secondary or tertiary), all four paradigms do prescribe some form of education and a number of such programs are currently in use: some of them teach values and skills for living in cultural diversity, peaceful co-existence and conflict management. Others teach language and interaction skills as ways of helping children relate meaningfully with others and their natural environments, yet others teach problem solving and critical thinking<sup>38</sup>. Each of the programs can be targeted at high risk children<sup>38</sup>.

A number of models have been used to account for behaviour change: among them social cognitive, transtheoretical and learning models. Social cognitive theory looks at behaviour as a triadic, dynamic and reciprocal interaction between environmental, personal, and attributes of the behaviour itself<sup>39</sup>, and behaviour change as an outcome of the interplay between the three<sup>40</sup>. The environment, according to the theory, encompasses the social such as family, friends and colleagues, and physical such as size of room, ambient temperature, and availability of certain foods. It looks at person-behaviour interactions as bi-directional, with one's thoughts, emotions, and biological properties influencing one's actions. It sees a second level of interaction: that between

the environment and personal characteristics, where the individual's expectations, beliefs, and cognitive competencies develop and are modified by the social influences and physical structures in the environment. It sees yet another level of interaction: that between individuals and their environment, where the individuals produce and are also products of their environment.

Transtheoretical model views behavior change as a progressive process<sup>41</sup> involving a number of stages including pre-contemplation, contemplation, preparation, action and maintenance stages. It sees individuals as progressing through these stages at varying rates, often moving back and forth several times along a continuum before finally attaining the goal of maintenance. The stages are spiraling or cyclical rather than linear<sup>41</sup>. It suggests a ten phase process for behavior change beginning with; consciousness raising, followed, in order, by; dramatic relief, environmental re-evaluation, social liberation, self-re-evaluation, stimulus control, helping relationships, counter conditioning, reinforcement management and self liberation<sup>42</sup>. It suggests tailoring of interventions to match individual readiness or stage of change<sup>42</sup>.

Learning theories emphasize learning of new complex patterns of behavior as outcomes of modifications of many small behaviors that constitute complex ones<sup>41</sup>. The complex-behaviors are learned by first breaking them into smaller segments, which segments, are then established and reinforced first, sometimes, with rewards for partial accomplishment. Incremental increases are then made as the complex behaviors are "shaped" towards the targeted goal. The fact that the new behaviors must replace or compete with the established ones which could have been satisfying, habitual, or cued

by the environment often complicates the process of change. The model looks at most behaviors as learned and maintained under fairly complex schedules of reinforcement and anticipated future rewards <sup>41</sup>.

Although differing in specifics, all three models do acknowledge the importance of influences that are educational in nature on behaviour. Many of them seek to influence behaviour by changing perceptions, values, and beliefs and equipping people with problem solving skills. How effectiveness they are in changing behaviour remains a subject of debate and the conflicting conclusions from the different evaluations so far undertaken add to the puzzle. Programs that teach resistance and negotiation skills have, for example, been shown to have limited positive influence on knowledge and attitudes <sup>43–45</sup>, and even though a number of them have reported positive changes in behavior, little is actually known about their effects on behaviors <sup>24, 25, 38, 45–49</sup>.

The “Second Step”, another educational intervention that focuses on three competencies—empathy, impulse control and problem solving, and anger management, was found to have decreased physically aggressive behavior among children, and increased neutral and pro-social behavior in school<sup>50</sup>. Two other curricula, the violence prevention curriculum for adolescents, and the Conflict Resolution Curriculum for Youth Providers that were tested in Augusta Georgia in 1993/4, were also found to successfully reduce three indicators of violence; only the conflict resolution curriculum was, however, successful in reducing the frequency of more severe physical fights that required medical treatment<sup>51</sup>. The three indicators were self-reported use of violence in hypothetical conflict situations, use of violence in the previous 30 days and physical fights in the previous 30 days

Another review found schools-based peer-led programs, including peer counselling, peer mediation, and peer leaders, ineffective<sup>52</sup>, a finding that was later confirmed by a meta-analysis, which, in addition, showed adult-led programs to be as, or more effective, in reducing youth violence and related risk factors than peer-led programs<sup>53</sup>. These contradicting conclusions, in part, reflect the complexity of the problem, and the associated paradigmatic and measurement issues involved in their study.

The current study analysed secondary data from a pilot study that evaluated the “Mato-Oput 5”- a schools-based non-violent conflict resolution curriculum. The curriculum had been specifically developed for the war affected children of Northern Uganda. Values of peace and non-violent conflict resolution skills were taught, with the aim of producing people who understood the causes and effects of conflicts and were skilled in preventing or resolving them non-violently.

### **1.2.5 Background to intervention**

The Northern Region of Uganda had been in a state of war for 20 years. Hospital based surveillance had shown violence to be one of the leading causes of the region’s injury burden (unpublished data). A 1998 district wide survey by the Injury Control Center-Uganda (ICC-U) in Gulu (one of the 4 most affected districts in the region, see appendix i), confirmed the findings of the hospital surveillance and showed schools to be second leading places of violent injuries and deaths in the district<sup>10</sup>. The study recommended peace building as a way addressing the problem of violence that had been entrenched in the children following their prolonged exposure to the war.

The peace building was to be undertaken in the context of a formalized schools-based curriculum. Consequently, the “Mato-Oput 5” curriculum was developed and piloted in six primary schools in 2002/2003 as part of the concerted public health response to the problem of violence in the region. Pre-hospital and specialized emergency care training was also provided to the nearby communities and health units respectively.

The intervention was a non-violent conflict resolution curriculum called “Mato-Oput 5”. It was specifically developed for Gulu schools, following earlier baseline studies in the district. The goal of the curriculum was to produce young people who understood the causes and consequences of conflicts and had skills for resolving them non-violently. It had ten learning areas including: conflict, peace, conscience, empathy, anger management, self-control/impulse control, fairness, kindness, reconciliation (*mato-oput*) and non-violence<sup>2</sup>.

Conflict was considered in the curriculum as a normal fact of life stemming from interpersonal differences which could be physical, social, intellectual or emotional. Violence was addressed as a premeditated and learned negative behavioural response to conflict. The teaching of concepts and values of peace were prescribed as a strategic solution to the culture of violence that had pervaded the region.

The curriculum was independently scheduled on the school timetable with at least two-40 minute weekly sessions over a period of one school term (three months). It was taught by the primary five class teachers who had received pre-implementation training on how to handle the curriculum. They also received a three day first aid training covering the basics of life support: all six schools benefited from this component. The

schools received first aid kits and were linked to Lacor, one of the region's main hospitals, to facilitate emergency referrals for severe injuries.

The learning areas were designed to instil values of cooperative living, togetherness and care for others. Specifically, to: help learners develop correct attitudes for responsible citizenship; increase learners' awareness of dangers and consequences of violence; increase learners' knowledge of methods of conflict resolution and violence prevention; enhance discipline and good manners among learners'; reduce bullying by learners' in schools; and help learners' develop values of peace and reconciliation. Both boys and girls participated: their ages ranged from 9-18 years.

Grade 5 children were used in the pilot because of their good command of the English language (the language used in the materials), and availability for follow-up within the study schools. All the children studied had; lived through the war, and experienced its associated traumas described elsewhere <sup>51</sup>. A significant proportion of them were well above the average age (11 years) for Grade 5 in Uganda, a "symptom" of the disruptive effect of the war on their schooling program. Both groups of children, however, had the "over age" children

The materials were collaboratively developed by four agencies: the Injury Control Center-Uganda (ICC-U), the Uganda National Curriculum Development Center (NCDC), the Canadian Network for International Surgery (CNIS), and Jamii Ya Kupatanisha (JYAK). It had input from other curricular that had been used in Kosovo and Afghanistan, both war affected areas. It was taught over a period of three months during the second school term by the Primary five teachers.

The effectiveness of the curriculum was assessed using pre- and post-intervention injury and violence surveillance in the six schools (see appendix ii: surveillance tool). A pre- and post-intervention quantitative evaluation of attitudes was also undertaken to evaluate the effect of the curriculum on the children's attitudes towards conflict and violence (see appendix iii: attitudes tool).

The curriculum was piloted as a community trial in six primary schools. The schools had been stratified by setting into urban, peri-urban and rural, and one of the schools in each of the categories had been randomly assigned to the intervention or control groups. Security and accessibility were key inclusion considerations.

The intervention group comprised of Lacor, Gulu Town, and Koro Primary Schools, with 505 children and the control group comprised of Christ the King Demonstration, Highland, and Koro Abili Primary Schools, with 522 children. The entire grade five classes in the intervention schools were taught the curriculum, while the controls received only first aid training as part of a general injury prevention program. Displaced schools\* were excluded from the study.

The teaching of the curriculum was monitored and supervised by the four agencies in collaboration with the District Education department. The pictorial illustrations of the concepts taught, anecdotal evidence from the oral interviews with the teachers and children and teacher's preparatory notes were used for this purpose.

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Displaced schools refer to the schools which were forced to relocate from their original locations on account of the war. Many of the schools in Gulu district had to relocate to temporary safer areas such as the protected camps for internally displaced people and Gulu municipality.

## **2.0 METHODS AND MATERIALS**

The study was secondary analysis of data from a pilot study that evaluated the “Mato-Oput 5”, a school-based non-violent conflict resolution curriculum.

### **2.1 Original study**

#### **2.1.1 Design**

The original study employed a cluster randomised controlled design.

#### **2.1.2 Setting**

It was conducted in Gulu, a war affected Northern Ugandan district in 2002/2003. Gulu is approximately 300 kilometres from Kampala, the Ugandan capital. Six Primary Schools; two of them urban, two peri-urban, and two rural participated. All the schools were located within 12 kilometres from Gulu Town Centre.

#### **2.1.3 Population**

Gulu had a projected 2000 mid-year population of 469,700, 11.3% of it was urban <sup>54</sup>.

#### **2.1.4 Sampling procedure**

Schools were used as primary sampling units: six of them were selected out of the 234 schools in the district. Accessibility, security, logistics and whether or not the school was displaced\* were key considerations. The schools were stratified by setting into urban, peri-urban and rural. Two schools were selected from each of the strata and one of the schools in each of the categories was then randomly allocated to the intervention or control groups. The entire primary five classes in the intervention schools were

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\* Displaced schools are those that had to temporarily move to new sites to escape from the insecurity in their original locations

taught the curriculum. The choice of primary five children was based on their command of English language- the language of the curriculum, and the availability of the children for follow up within the same schools. The head teachers and primary five teachers of the intervention schools were trained to teach the curriculum.

### **2.1.5 Data collection and measurement**

The effectiveness of the curriculum was evaluated using pre-and post intervention: surveillance of injuries and violence, and quantitative evaluations (surveys) of attitudes. Two instruments (appendices ii and iii) were used: the injury and violence surveillance instrument was adapted from ones used in school surveillance in South Africa and Uganda. Self reported incidents were recorded by teachers who had received specific training in using the tool. The attitudes tool was developed at the Injury Control Center-Uganda and piloted in a non-project school in Gulu. It was administered to all the primary five children in the study by a team of specifically trained Nurses from the near by hospital. Attitudes were assessed on a 4-point likert scale, and negative attitudes were inferred from responses judged to support, promote or imply violence.

## **2.2 Current study**

### **2.2.1 Study Design**

The current study is analysis of secondary data from the 2002/3 trial of the “Mato-Oput 5”<sup>\*</sup> curriculum in Northern Uganda.

### **2.2.2 Sample selection**

The entire sample from the original study was included in the analysis.

### **2.2.3 Objectives**

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<sup>\*</sup> Mato-Oput 5: the name of the non-violent conflict resolution curriculum

The main objective of the study was to evaluate the effectiveness of the “Mato-Oput 5” curriculum in preventing pupil perpetrated acts of violence in schools. The specific objectives were to:

2.2.3.1 Describe the demographic characteristics of the study sample

2.2.3.2 Determine differences between children exposed to and those not exposed to the “*Mato-Oput 5*” regarding their attitudes towards conflict and violence.

2.2.3.3 Compare rates of pupil-perpetrated intentional (violent) incidents among children exposed to and those not exposed to the “*Mato-Oput 5*” curriculum.

2.2.3.4 Make recommendations regarding school based non-violent conflict resolution education as a strategy for youth violence prevention.

## **2.2.4 Hypothesis**

### ***2.2.4.1 Alternate hypothesis***

2.2.4.1.1 Children who are exposed to the “Mato- Oput 5” curriculum are less likely to have negative attitudes towards conflict and violence.

2.2.4.1.2 The rate of intentional incidents among children exposed to the “Mato- Oput 5” curriculum is lower than the rate among those not exposed to it.

### ***2.2.4.2 Null hypothesis***

2.2.4.2.1 There are no differences in attitudes towards conflict and violence between children who are and those who are not exposed to the “Mato-Oput 5”.

2.2.4.2.2 There are no differences in rates of intentional incidents among children who are exposed to and those who are not exposed to the “Mato-Oput 5” curriculum.

## **2.2. 5 Data management**

### **2.2.5.1 The original datasets**

The original data were collected using the questionnaires in appendices ii and iii, and secured in electronic form in EPI6 format. The data were stored in four data bases; two containing the pre-intervention data (injury and violence surveillance and quantitative evaluation of attitudes data) and two, the post-intervention data. The injury and violence surveillance datasets had 23 variables each, and the attitudes datasets had 37 variables.

### **2.2.5.2 Data cleaning and variable selection**

The four datasets were imported into Epi\_Info Version 3.2 <sup>55</sup> and examined for completeness and consistency of variable names. The corresponding pre-and post-intervention datasets were merged and converted into Stata formats using the Stat-Transfer software. The variables relevant to the objectives of this study were extracted using Stata 8 <sup>56</sup>. This was accomplished through factor analysis for the attitudes, and the keep and drop commands for the injury and violence surveillance datasets. The modified datasets were then stored in two Stata data bases.

Twelve variables were retained out of the 37 in the attitudes dataset; they included; “a bully should be forgiven”; “boys should not touch girls’ breasts”; “if my friend steals my book and returns it, I shall forgive him/her”; “if some one ambushes my friend, I will report him/her to the teacher”; “even if someone kicks me, I will not fight back”;

“If someone pinches me, I will try to get my bigger brother or sister to beat him/her”; “If my friend abuses me, I will forgive my friend”; “If my friend tells a lie about me, I will fight”; “If my friend steals my pen, I will fight”; “I feel sad for a pupil who is beaten”; “girls should be made to uproot anthills, like the boys, if they do wrong”; “I abused someone this week”; and “people who have a quarrel should solve it by force”.

Six variables were selected from the injury and violence dataset because of their relevance to the current study. They included age, gender, school, studyphase (before or after intervention), intent (Intent of incident) and treatment (if the child received school first aid or treatment from a health facility). The new data were explored using the list, describe and summarize Stata commands, and labelled before final analysis. The overall intentional incident and severe intentional incident rates were calculated from the injury and violence surveillance data.

### **2.2.5.3 Data analysis**

The demographic characteristics of the sample were described using frequency distributions of age, sex, group (intervention and control) and setting (rural, peri-urban, and urban).

The 32 variables in the attitudes dataset were reduced to 12 using factor analysis (factor loadings  $\geq 0.30$  on the two principle factors); the 12 variables were then subjected to further analysis. The excluded variables were: “if I catch someone stealing my sugar cane, I will fight”; “I feel bad each time I fight with someone”; “It is wrong to fight someone who abuses your parents”; “If your father loves your mum, he should not beat her”; “quarrels between school children should be handled by teachers”; “a bully

should be punished”; “latecomers should not be beaten”; “girls should not insult boys”; “rebels who have killed people should not be allowed home”; “I understand when my friends refuse my advice”; “I don’t mind when other pupils don’t play with me”; “girls are less important than boys”; “it is good to send a girl to school”; “young children should be protected from abduction”; “I fought with someone this week”; and “I feel good when I forgive my friend”. They had low factor loadings (factor loadings  $\leq 0.30$ ).

Factors selection was based on the Kaiser criterion (eigenvalues greater than 1) and validation was based on the scree test. The Kaiser (1960) criterion recommends exclusion of any factor that does not extract at least as much as an equivalent of one original variable<sup>57</sup>.

The attitudes data were analysed as survey data using Stata’s svyset commands with schools as primary sampling units (PSU) <sup>56</sup>. Attitudes were assessed at group level because randomisation had been done at group level. Group Attitude tendencies (the attitude held by the majority of the study participants) were determined from the group modal responses on the 4 point Likert scale used in the original questionnaire (1=strongly disagree, 2=disagree, 3=agree, and 4=strongly agree), taking into account clustering at school level. The differences between the two groups with regard to their attitude tendencies were evaluated using adjusted Pearson  $X^2$  tests for trends. Negative attitudes were inferred from responses judged to support or promote or suggest violence, which depended on the way the different questions were asked. The effects of the intervention on attitudes were assessed using svyset regression modelling.

Violence was determined from incident intent. The rates of intentional incidents and severe intentional incidents before and after intervention were calculated for the two groups of children and compared for baseline and post-intervention differences using t-tests. The changes in rates of intentional incidents and severe intentional incidents over time, and the role of the intervention in this, were evaluated using generalized estimation equation and Poisson regression modelling, because of the clustering at school level.

#### **2.2.6 Ethical considerations**

Permission for use of data was granted by the Injury Control Center-Uganda. Approval was also granted by the University of Witwatersrand's Committee for Research on Human subjects (Clearance Certificate NoR14/19, ref Appendix IV). The original project had approval from Gulu District Local government, Gulu District Education Office, Gulu District Health Department, the respective schools and their management committees (parent's representatives). The project also had clearance from the Uganda National Council of Science and technology.

### 3.0 RESULTS

#### 3.1 Demographic characteristics of the sample

A total of six schools representing a total pupil population of over 7 000 participated. All the schools were within 12 km from Gulu town centre. They had a total grade five pupil population of 1027 and the demographic characteristics of the groups are as follows:

##### 3.1.1 Age distribution at baseline

The children studied were all between 9 and 18 years, with a mean age of 12.3 years (SD= 1.2). The mean age of the intervention group was 12.4 years (SD=1.2, Range = 9-16 years) compared to the mean age of the control group (12.3 years, SD= 1.3, Range = 9 -18 years- see table 3.1 below). The age differences at baseline were not statistically significant ( $t = -0.4334$   $P > |t| = 0.6648$ ).

**Table 3.1 Pre-and post-intervention age distribution by group**

Group	Pre-intervention				Post- intervention			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Intervention	12.36	1.21	9	16	12.36	1.20	9	16
Control group	12.33	1.33	9	18	12.33	1.33	9	18
<b>Total</b>	12.34	1.26	9	18	12.34	1.27	9	18

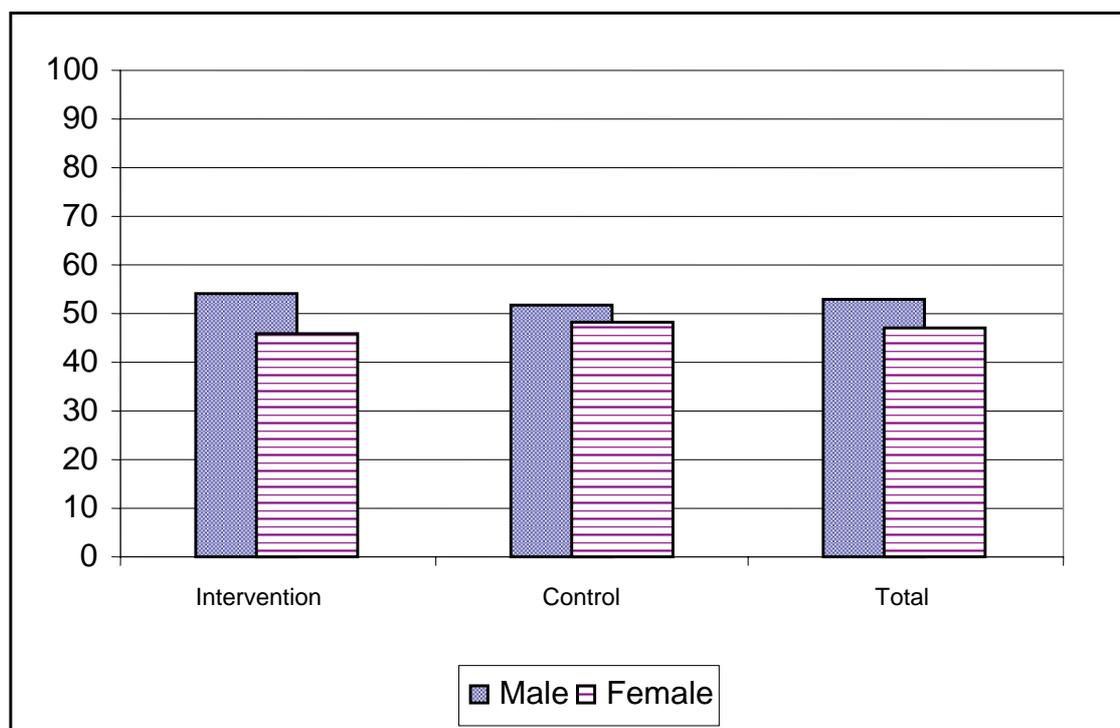
##### 3.1.2 Gender profile at baseline

Fifty three (53) % of the sample was male; the male: female ratios of the intervention and control groups were 117:100 and 104: 100 respectively. The sex differences at baseline were not also statistically significant ( $X^2=0.5341$ ,  $p\text{-value}=0.465$  see Table 3.2, figure 3.1)

**Table 3.2 Pre- and post-intervention sex distribution by group**

Group	Gender	Pre-intervention		Post-intervention	
		Freq	%	Freq	%
Intervention	Male	270	54	270	51.11
	Female	230	46	229	45.89
Control	Male	270	52	270	51.82
	Female	250	48	251	48.18
Total	Male	540	52.94	540	52.94
	Female	480	47.06	480	47.06

**Figure 3.1 Gender profiles by group**



### 3.1.3 Setting

Two of the schools were urban (Gulu Town and High Land Primary Schools), two were peri-urban (Lacor and Christ the King Demonstration Schools) and two were rural (Koro and Koro Abili Primary Schools). The peri-urban schools contributed 52.2 % of the Grade 5 children in the study, compared to the urban (32.4%) and rural (15.4%) schools.

### 3.2 Attitude tendencies

Attitude tendencies were based on group modal responses to the questions asked. The assessed was based on the 4 point Licket scale that was used in the original study. The principle factors were extracted and only the 12 variables that had high factor loadings on them were analysed further.

#### 3.2.1 Pre-intervention attitude tendencies

Two factors were retained as principle on the basis of the Kaiser criterion (eigenvalues greater than 1 - see table 3.3; the Kaiser (1960) criterion recommends exclusion of a factor that does not extract at least an equivalent of one of the original variables<sup>47</sup>). They accounted for 99% of the baseline variability in attitude tendencies towards conflict and violence, and only 12 of the 32 variables loaded significantly (factor loadings  $\geq 0.30$ ) on them.

**Table 3.3 Eigenvalues for principle factors at baseline**

<b>(iterated principal factors; 2 factors retained)</b>				
<b>Factor</b>	<b>Eigenvalue</b>	<b>Difference</b>	<b>Proportion</b>	<b>Cumulative</b>
1	2.59153	1.36608	0.6790	0.6790
2	1.22545	0.58714	0.3211	1.0000
3	0.63830	0.11256	0.1672	1.1672
4	0.52574	0.06746	0.1377	1.3050

The 12 variable-instrument was then used to evaluate the two groups of children for pre- and post intervention differences in attitude tendencies towards conflict and violence. Table 3.4 shows the baseline attitude tendencies. The group modal responses were deemed to represent the group attitude tendencies. There were no statistically significant differences between the two groups, at baseline, with regard to their attitude tendencies towards conflict and violence (see table 3.4 below).

**Table 3.4 Pre-intervention attitude tendencies**

Variable	Intervention group				Control group				Design-based F	p-value
	1	2	3	4	1	2	3	4		
<b>Factor 1</b>										
A bully should be forgiven	9.8	6.2	24.7	59.4	11.7	7.5	19.4	61.5	0.2	0.727
Boys should not touch girls' breasts	13.4	6.8	13.2	74.2	9.2	4.4	4.9	81.7	1.2	0.332
If my friend steals my book and returns it, I shall forgive my friend	3.1	10.5	10.3	76.1	3.3	1.5	6.1	89.1	4.1	0.084
If someone ambushes my friend, I will report him to the teacher	1.8	2.6	7.9	87.7	3.8	0.9	4.9	90.2	2.2	0.175
Even if someone kicks me, I will not fight back	30.9	10.9	25.5	32.7	31.4	4.4	18.9	45.4	0.7	0.490
If my friend abuses me, I will forgive him/her	5.4	6.8	28.8	59	9.1	5.6	15.4	69.9	1.8	0.236
I feel sad for a pupil who is beaten	7.9	5.2	12.5	74.4	4.9	3.1	7.1	84.9	2.4	0.144
If someone pinches me, I will try to get my big brother/sister to beat him	43.6	11.2	16.5	28.7	27.4	7.9	10.7	54	1.9	0.208
If my friend tells a lie about me, I will fight	55.7	8.3	9.6	16.3	65.5	11.7	8.8	13.9	0.9	0.393
If my friend steals my pen, I will fight	54.7	14.2	19	12	60.4	8.9	11.5	19.2	0.8	0.430
<b>Factor 2</b>										
Girls should be made to uproot anthills like boys if they do wrong	19.5	4.4	29.7	46.4	10.8	4.0	21.2	64.0	0.9	0.410
I abused someone this week	52.7	13.2	12.9	21.2	44.2	8.3	15.9	31.7	0.9	0.441
People who have a quarrel should solve it by force	53.9	10.3	3.8	32	77.6	1.7	1.5	19	1.7	0.245

**1= Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly Agree**

### **3.2.2 Post-intervention attitude tendencies towards conflict and violence**

The criteria applied to the pre-intervention attitudes data were also applied to the post-intervention attitudes data, and Table 3.5 presents the result of the assessment. This time, however, there were statistically significant differences between the two groups regarding some of the variables that loaded highly on factor 1 (the “forgiveness” factor). The intervention group, was more likely to support the forgiving of a bully (p-value= 0.04), the forgiving of a friend who returns a book he/she had stolen (p-value= 0.036) and not fighting a friend who tells a lie about one as compared to the control group (see Table 3.5).

Further analysis showed the intervention to have contributed significantly to the post-intervention attitude differences between the groups as presented in Table 3.6 below. After controlling for study phase, there was a significant association between the intervention and the post-intervention attitude tendencies regarding forgiving a bully (OR=3.6, p-value= 0.010), forgiving a person who abuses one (OR=2, p-value= 0.002), and forgiving a person who returns a book he/she had stolen (OR= 3, p-value= 0.020). There was also a “boarder line” effect on the tendency to support teacher involvement in resolving quarrels between children (OR=1.3, p-value= 0.076) and the tendency to admit wrong (having abused some one, OR= 0.4, p-value=0.027, see table 3.6)

**Table 3.5 Post-intervention Attitude tendencies**

Variable	Intervention group				Control group				Design-based F	p-value
	1	2	3	4	1	2	3	4		
<b>Factor 1</b>										
A bully should be forgiven	13.0	2.6	6.6	77.8	31.8	8.4	10.7	49.1	10.0	0.008
Boys should not touch girls' breasts	46.9	2.4	3.9	46.9	47.8	8.3	8.3	35.7	0.6	0.498
If my friend steals my book and returns it, I shall forgive my friend	3.2	1.1	5.4	90.3	7.4	4.6	7.4	80.7	4.8	0.036
If someone ambushes my friend, I will report him to the teacher	10.8	0.9	4.5	83.8	12.3	2.6	2.6	82.5	1.5	0.277
Even if someone kicks me, I will not fight back	18.3	1.9	6.9	72.8	33.0	8.9	11.6	46.4	3.7	0.088
If my friend abuses me, I will forgive him/her	6.7	1.9	3.7	87.7	10.2	6.1	11.2	72.6	10.3	
I feel sad for a pupil who is beaten	51.6	2.2	3.7	42.6	21.8	5.0	5.7	68.5	1.3	0.316
If someone pinches me, I will try to get my big brother/sister to beat him	63.4	1.5	6.5	28.7	47.3	9.2	15.5	28.1	2.9	0.135
If my friend tells a lie about me, I will fight	58.4	3.7	7.8	30.2	36.3	14.6	17.6	31.4	4.6	0.046
If my friend tells a lie about me, I will fight										
If my friend steals my pen, I will fight	55.3	2.6	7.8	34.3	40.6	14.4	13.8	31.2	3.8	0.085
<b>Factor 2</b>										
Girls should be made to uproot anthills	45.4	6.1	9.8	38.6	43.1	9.0	8.3	39.6	0.3	0.737
I abused someone this week	56.7	6.9	9.3	27.1	30.5	5.6	17.7	46.3	4.2	0.071
People who have a quarrel should solve it by force	68.7	2.8	2.6	26.0	78.0	5.2	3.4	13.4	1.2	0.334

**1= Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly Agree**

**Table 3.6 Determinants of post-intervention attitude tendencies**

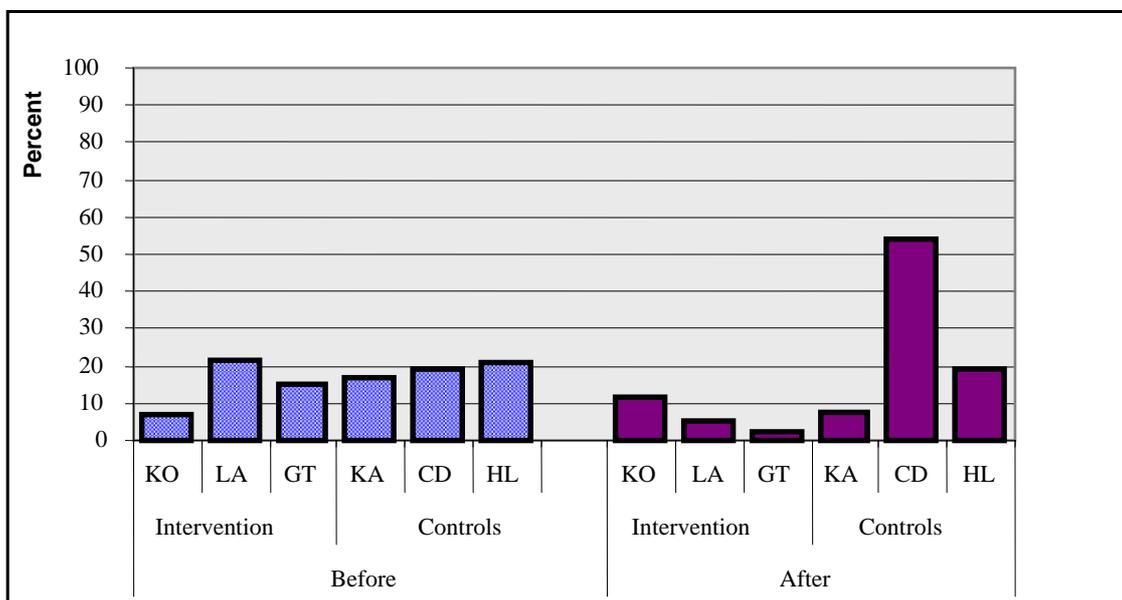
<b>Variable</b>	<b>Odds ratio</b>	<b>t</b>	<b>p-value</b>	<b>95% Conf. Interval</b>
<b>If my friend abuses me, I will forgive him/her</b>	2.0	6.16	0.002	1.52 - 2.76
<b>Even if someone kicks me, I will not fight back</b>	2.8	1.79	0.133	0.64 - 12.66
<b>If my friend steals my book and returns it, I shall forgive my friend</b>	3.0	3.35	0.020	1.29 - 7.05
<b>Boys should not touch girls' breasts</b>	1.3	0.31	0.766	0.14 - 12.42
<b>If someone ambushes my friend, I will report him to the teacher</b>	1.3	1.00	0.363	0.64 - 2.71
<b>A bully should be forgiven</b>	3.6	3.99	0.010	1.56 - 8.33
<b>I feel sad for a pupil who is beaten</b>	0.3	-1.02	0.353	0.02 - 5.72
<b>I abused someone this week</b>	0.4	-3.09	0.027	0.16 - 0.84
<b>If someone pinches me, I will try to get my big brother/sister to beat him</b>	0.7	-0.71	0.510	0.19 - 2.54
<b>If my friend tells a lie about me, I will fight</b>	0.6	-1.15	0.303	0.23 - 1.76

### 3.3 Injury and violent incidents

#### 3.3.1 Injury and violent incidents by school

A total of 511 incidents were reported in the intervention and control groups before and after intervention, 46% of them were intentional and 57% (289) of them occurred before the intervention. Christ the King Primary School had the highest number (34%) of incidents, followed by Highland Primary School (20%), Lacor Primary School (15%), Koro Abili Primary School (13%), Gulu Town Primary School (9%) and Koro Primary School (8%). The pattern of incidents by school before and after intervention is presented in figure 3. 2. There was a marked rise of incidents in Christ the King Primary School in after intervention.

**Figure 3.2 Distribution of incidents by School**



The mean age of the victims of the intentional incidents was 12.8 years (SD= 1.2) with a minimum of 10 years and a maximum of 16 years. More than half (59.5%) of the victims were male, the pre- and post-intervention male: female ratios in the victims of intentional incidents were both 14:10. Intentional incidents constituted 53%

of the total number of incidents before intervention and 38% of incidents after intervention. Slightly over one third (37%) of the incidents were severe enough to warrant school first aid or treatment in a health facility. The severe incidents (those that warranted school first aid or treatment in a health facility) constituted 30% of the total number of incidents before intervention and 45% of incidents after intervention.

### 3.3.2 Incident rates before and after intervention

#### 3.3.2.1 Intentional incident rates before and after intervention

Before intervention, the over all mean intentional incident rate was 320/1000: this was contributed by mean pre-intervention intentional incident rates of 270/1000 and 370/1000 in the intervention and control groups respectively (see-Table 3.7).

After intervention, the over all mean intentional incident rate was 270/1000. Again this was contributed by mean post-intervention intentional incident rates of 190/1000 and 350/1000 in the intervention and control groups respectively. The differences between the mean pre- and post intervention intentional incident rates in the two groups of children were not, however, statistically significant ( $t=1.0416$ ,  $p\text{-value}=0.3564$  and  $t=0.8316$ ,  $p\text{-value}=0.4524$ , respectively, see Table 3.7)

**Table 3.7 Pre-and post-intervention intentional and severe intentional incident rates by group**

	Group	Before/1000	After/1000	Difference/1000
Intentional incident rates	Intervention	270 (CI=120-430)	190 (CI=-49-890)	80
	Control	370 (CI=0.30-740)	350 (CI=-13-710)	20
	Over all	320 (CI=50-500)	270 (CI=50- 500)	50
Severe intentional incident rates	Intervention	70 (CI=-40-190)	150 (CI=-360-650)	80
	Control	120 (CI=10-220)	160 (CI=20-300)	40
	Over all	100 (CI=50-140)	150 (CI=10-290)	50

#### 3.3.2.2 Severe intentional incident rates before and after intervention

Before intervention, the over all mean severe intentional incident rate was 100/1000. This was contributed by mean pre-interventional severe intentional incident rates of 70/1000 and 120/1000 in the intervention and control groups respectively (see Table 3.7). After intervention, the over all mean severe intentional incident rate was 150/1000, and again this was contributed by mean post intervention severe intentional incident rates of 150/1000 and 160/1000 in the intervention and control groups respectively. The differences between the mean pre- and post intervention severe intentional incident rates in the two groups of children were also not statistically significant ( $t=1.1759$ ,  $p\text{-value}= 0.3048$  and  $t=0.1258$ ,  $p\text{-value}= 0.9060$  respectively, see Table 3.7)

### 3.3.3 The relationship between the intervention and intentional incidents

#### 3.3.3.1 The effect of the intervention on intentional incident rates

After controlling for study phase (before or after) and group (intervention or control), there was no association between the intervention and intentional incident rates (Wald  $\chi^2(3) = 1.59$ ,  $p\text{-value} = 0.6620$ ). Although, the negative coefficient of group seemed to suggest that being in the intervention group had a reduced risk of experiencing an intentional incident (Coef  $-0.098$ ), this was not statistically significance ( $p\text{-value}=0.498$ , see Table 3.8).

**Table 3.8 Predictors of intentional incident rates**

Incident rate	Coef.	Std. Err	z	p-value	95% Conf. Interval
Phase	0.017	0.134	-0.28	0.897	-0.279 - 0.245
Group	-0.098	0.144	-0.68	0.498	-0.381 - 0.185
Phasegroup	0.053	0.189	-0.28	0.779	-0.424 - 0.318
Constant	0.367	0.102	3.60	0.000	-0.167 - 0.568

#### 3.3.3.2 The effect of the intervention on severe intentional incident rates

After controlling for study phase (before or after) and group, there was also no association between the intervention and severe intentional incident rates. Although the negative coefficient of group seemed to suggest being in the intervention group had a reduced risk of experiencing a severe intentional incident (Coef= -0.043), this was not statistically significant (p-value=0.6350, see Table 3.9).

**Table 3.9 Predictors of severe intentional incident rates**

<b>Severe intentional incident rates</b>	<b>Coef.</b>	<b>Std. Err</b>	<b>z</b>	<b>p-value</b>	<b>95% Conf. Interval</b>
<b>Phase</b>	0.043	0.066	0.65	0.514	-0.09 - 0.17
<b>Group</b>	-0.043	0.089	-0.47	0.635	-0.22 - 0.13
<b>Phasegroup</b>	0.027	0.093	0.29	0.769	-0.15 - 0.21
<b>Constant</b>	0.118	0.064	1.85	0.065	-0.01 - 0.24

### **3.3.4 The effect of the intervention on the number of incidents.**

#### **3.3.4.1 Intentional incidents**

Before intervention, 152 intentional incidents were reported, 8% of them in the intervention group. After intervention, the number of intentional incidents reduced to 84, 39.5% of them in the intervention group. After controlling for group, the intervention had a significant influence on intentional incidents, and both study phase and the interaction between group and study phase were significant predictors of intentional incidents (p-values=0.048 & <0.001 respectively). Group was not, however, an important predictor of intentional incidents (p-value= 0.942, see Table 3.10)

**Table 3.10 Predictors of intentional incidents**

Intentional incident rate	Coef.	Std. Err	z	p-value	95% Conf. Interval
Phase	0.21	0.108	1.98	0.048	-0.002 - 0.426
Group	-0.02	0.324	-0.07	0.942	-0.66 - 0.61
Phasegroup	-1.21	0.207	-5.84	0.000	-1.62 - -0.80
Constant	-1.12	0.224	-5.01	0.000	-1.56 - -0.68
Likelihood-ratio test of alpha=0: chibar2(01) = 22.33 Prob>=chibar2 = 0.000					

**3.3.4.2 Severe intentional incidents**

A total of 42 severe intentional incidents were reported before the intervention, 2.4% of them in the intervention group. After intervention, the number of severe intentional incidents increased to 87, 34.5 % of them in the intervention group. After controlling for group and study phase, there was no association between the intervention and severe intentional incidents. Study phase had borderline significance as a predictor of severe incidents (p-value=0.068, see Table 3.11). Study group was negatively associated with both the intentional incidents and severe intentional incidents, although the relationships were not statistically significant (p-values=0.726 & 0.942 respectively, see Table 3:11).

**Table 3.11 Predictors of severe intentional incidents**

Severe violence rates	Coef.	Std. Err	z	p-value	95% Conf. Interval
Phase	0.33	0.179	1.82	0.068	-0.02 - 0.68
Group	-0.19	0.559	-0.35	0.726	-1.29 - 0.90
Phasegroup	0.22	0.313	-0.71	0.476	-0.84 - 0.39
Constant	-2.15	0.380	-5.66	0.000	-2.89 - -1.49
Likelihood-ratio test of alpha=0: chibar2(01) = 29.76 Prob>=chibar2 = 0.000					

### 3.3.5 Trends

#### 3.3.5.1 Intentional incidents and intentional incident rates

The combined mean difference between the total number of intentional incidents before and after intervention was -11.17. This was contributed by mean differences of -27.33 and 5 in the intervention and control groups respectively. These differences were not, however, statistically significant ( $t=0.9361$ ,  $p\text{-value}= 0.4022$ ). The combined mean difference between the intentional incident rates before and after the intervention was 50/1000. This was contributed by mean rate differences of -70/1000 and -20/1000 in the intervention and control groups respectively. Again, the differences were not statistically significant ( $t= -0.28, 03$ ,  $p\text{-value}= 0.7932$ , see Table 3:12)

**Table 3.12 Trends of intentional incidents and intentional incident rates**

	Group	Mean difference	95% Conf. Interval
Mean difference in number of intentional incidents	Intervention	-27.33	-102-48.27
	Control	5.00	-102-48.27
	Over all	-11.17	-55-32.68
	Difference	32.33	-63.57-128.24
Degrees of freedom: 4, Ho: mean(control)-mean(intervention)=diff=0, $t=0.9361$ , $p\text{-value}= 0.4022$			
Mean differences in intentional incident rates	Intervention	-0.07	-0.61-0.47
	Control	-0.02	-0.62-0.59
	Over all	0.04	-0.26-0.18
	Difference	0.05	-0.47-0.58
Degrees of freedom: 4, Ho: mean(control)-mean(intervention)=diff=0, $t= -0.2803$ , $p\text{-value}= 0.7932$			

#### 3.3.5.2 Severe intentional incidents and severe intentional incident rates

The combined mean difference between the total number of severe intentional incidents before and after intervention was 2.17. This was contributed by mean differences of 0.33 and 4 in the intervention and control groups respectively. Although the mean difference was bigger in the controls compared to the intervention

group, the differences were not, however, statistically significant ( $t=0.5458$ ,  $p\text{-value}=0.6141$ ).

The combined mean difference between the severe intentional incident rates before and after intervention was 60/1000. This was contributed by mean differences of 90/1000 and 40/1000 in the intervention and control groups respectively. Again, the differences were not statistically significant ( $t= -0.2937$ ,  $p\text{-value}= 0.7836$ , see Table 3:13)

**Table 3.13 Trends of severe incident and severe incident rates**

	Group	Mean difference	95% Conf. Interval
Mean difference in number of severe intentional incidents	Intervention	0.33	-25.52-26.47
	Control	4.00	-8.91-16.91
	Over all	2.17	-5.84-10.17
	Difference	3.67	-14.98-22.31
Degrees of freedom: 4, Ho: mean(control)-mean(intervention)=diff=0, $t=0.9361$ , $p\text{-value}= 0.4022$			
Mean differences in severe intentional incident rates	Intervention	0.09	-0.33-0.47
	Control	0.04	-0.003-0.081
	Over all	2.17	-0.05-0.16
	Difference	0.03	-0.28-0.78
Degrees of freedom: 4, Ho: mean(control)-mean(intervention)=diff=0, $t= -0.2803$ , $p\text{-value}= 0.7932$			

#### **4.0 DISCUSSION**

The study evaluated the effectiveness of the “Mato-Oput 5” curriculum- a schools-based non-violent conflict resolution curriculum in preventing pupil perpetrated acts of violence in schools: specifically, in changing children’s attitudes towards conflict and violence, and in reducing rates of pupil perpetrated acts of violence in schools.

Two groups of school children were studied; they had comparable baseline demographic characteristics, attitudes towards conflict and violence, and rates of intentional and severe intentional incidents (violence). Their demographic profiles, and rates and trends of intentional and severe intentional incidents remained comparable after intervention: their attitudes towards conflict and violence, however, differed significantly after intervention, with the intervention group tending towards forgiving of offenders and a non-forceful response to provocation more than the control group.

These results support a beneficial effect in the curriculum regarding attitudes towards conflict and violence, a finding that is consistent with conclusions of the systematic review with meta-analysis by Mytton et’al <sup>53</sup>. The results, however, failed to support a beneficial effect on acts of violence, in contradiction to Mytton’s conclusion of immediate beneficial effect on aggressive and violent behaviours in children who already exhibited such behaviour <sup>53</sup>. Another study had also shown a similar intervention to be effective in reducing negative school behaviours, especially when it was supplemented with other supportive curricula and activities<sup>58</sup>.

A number of reasons could have accounted for the failure to demonstrate a significant effect on acts of violence in spite of the significant change in attitudes towards conflict and violence: firstly, being a first draft, the curriculum had not benefited from any previous evaluation. While this first design may have appropriately addressed attitudes, it may not have done the same for behaviour. This study was the first rigorous review and will therefore guide form the basis of the modifications in the second edition. Issues for review will include the way cognitive, affective and behavioural<sup>48</sup> components of attitudes will be addressed and measured and how the transition from attitudes to behaviour is measured and monitored. Unlike the present study, majority of the studies in Mytton's review had used standardized tests to measure aggressive behaviour besides actual acts like physical fighting, and bullying<sup>53</sup>; they did not also collect data on violent injuries<sup>53</sup>.

A second reason for the lack of effect may have been the follow up period, which may have been too short to demonstrate a significant effect on acts of violence. The trends in attitudes were indication that the process of behaviour change had been initiated, which may have reached a significant effect size with a longer follow up. This is in agreement with a transtheoretical thinking which posits behaviour change as a multi-stage process that begins with consciousness raising followed by dramatic relief, environmental re-evaluation, social liberation, self-re-evaluation, stimulus control, helping relationships, counter conditioning, reinforcement management and self liberation<sup>42</sup>. Although Myton found immediate benefits on aggressive behaviour<sup>53</sup>, the current study did not; the differences may have originated from the ways in which outcomes were ascertained: while most of the studies in the review had used standardized tests besides actual acts, the current study used self reported incidents of

violence. The mid- and long-term effects of the curriculum on attitudes were not also determined.

A third reason may have been the sample size, which may have been too small to demonstrate a significant effect on acts of violence within the study period. The sample of six schools (three in each arm) in the original study was too small for the cluster randomised controlled design used; more over, schools were also used as the primary sampling units. A minimum of 12 schools (six per group) would have given the study sufficient power to detect an effect if it existed: this was not appropriately addressed in the pilot. This weakness may have affected the effect size demonstrated on attitudes: a bigger effect may have been possible. However, the fact that a significant effect was detected in spite of these limitations is evidence to support a beneficial efficacy in the Mato-Oput 5 curriculum: this will need to be conclusively answered with a better powered study.

Fourthly, the broader social environment, particularly the context of war may have curtailed the hypothesised effect of the intervention. This environment had promoted violence as the norm for two decades; its effects could not have been reversed within the three months of the study and this may have constrained the emergence of the values of peace introduced by the Mato-Oput 5 curriculum<sup>41</sup>. While children were taught values of peace at school, their homes and communities continued to harbour violence promoting factors like intimate partner abuse, poverty, disease, apathy, and deprivation. The curriculum did not prescribe a concomitant community action to reinforce the values of peace taught at school, and yet many young people who engage in antisocial behaviour often times have themselves had such experiences at

home<sup>58</sup>. Another study showed schools-based programs that are delivered with sufficient intensity and with community components to have measurable effects on high risk youth<sup>50</sup>.

Fifthly, the dramatic increase in intentional incidents in Christ the King Demonstration School, a control school after intervention may have biased the results. It was not clear why there was a sudden rise in intentional incidents in Christ the King primary school after intervention, but there may have been a change in the data collection system. This will need to be investigated further. Regarding the 8% loss to follow up, this was rather low compared to similar studies. The fact that majority of the population lived in confined internal displacement camps may have accounted for this.

The trends in severe intentional incidents contrasted those in attitudes and intentional incidents. They did not, however, seem to be genuine, but more of a reflection of the children's response to the availability of first aid services in the schools. The fact that the trends in the both groups were comparable was evidence to this (both groups had received first aid training and kits and both experienced rate increments). The first aid services could have increased the reporting and visibility of severe incidents.

While the study answered some of the original questions, a number of others arose: firstly, given the lack of effect on violent behaviour despite the change in attitudes, how valid are the causal assumptions regarding the relationship between negative attitudes and violent behaviour, and if indeed such a relationship exists, what is its nature and what models best represent it; secondly, if negative attitudes are part of the

causal constellation for violence, are they the necessary causes of violence; and finally, what would the implication of this understanding of the relationship between attitudes and violence be for the design and monitoring of educational violence prevention programs?

Regarding the relationship between attitudes and behaviour, a causal association is fairly well accepted; attitudes are known to predispose behaviour<sup>57</sup>. However, this relationship is not as simple because of other factors that also exert directive influences on behavior. Among them are social values, norms<sup>20</sup>, body chemicals and situation specific characteristics. The body chemical, for example, include alert transmitters and modulators, which are elevated in situations of threats<sup>16</sup>; moderators of perceived social safety and belonging, which are low when social conditions are perceived to be “unsafe” and not emotionally warm or when status is very low<sup>16,17</sup>; pain “numbing” modulators that responds to serious threats, and are released when threats occur<sup>17</sup>; modulators of behaviour and internal machinery of cells and genetic “switches”, which are elevated under threatening conditions<sup>16</sup>; and inhibitors of behaviour, which is low under conditions of threat except when someone uses aggression and successfully causes escape or “termination” of the aggression<sup>16</sup>.

Therefore, whereas attitudes do predispose behaviour, actual individual responses are subject to many other influences, which make the attitude-behaviour relationship not totally interdependent, as strong and adherent, in a strict sense, to any causal criteria like the Bradford Hill criteria. These influences often intervene to modify the directive effects of attitudes on behaviour. There is no evidence that attempts were made to identify and control such influences.

Finally, since attitudes are part of the causal constellation for violence, theoretically, changes in them would impact on the causal pathways of violent acts, with possibility of “aborting” them. As such, attitude change interventions can still play important roles in violence prevention given the fact that they are affordable and within the reach of many of the resource constrained countries. There is, however, need to emphasise the translation of attitude change to behaviour which may necessitate concomitant actions at family and community levels. There is also need to develop intermediate indicators for monitoring the transition from attitudes to behaviour. The current study did not address this.

### **Limitations of the study**

The study had a number of limitations; firstly, being a pilot, it may not have appropriately addressed some of the theoretical behaviour change issues. There is need to review the content of the curriculum, especially the way it addresses the cognitive, affective and behavioural aspects of attitudes<sup>59</sup>. The instruments used to measure attitudes were not also validated.

Secondly, the small sample size, given the cluster randomised control design used in the original study, denied the study power to demonstrate a positive result. A minimum of 12 clusters per group, instead of three, would have given the study sufficient power to detect effect on behaviour if it existed. It could have also enabled the study to demonstrate a bigger effect size on attitudes towards conflict and violence.

Thirdly, the sampling strategy used in the original study limits the study's external validity. Since the clusters were conveniently sampled because of the security reasons, the results may not be generalized to other settings. Fourthly, the length of follow up may have been too short to monitor the long term effects of the intervention on attitudes and violence; it is still not clear how long the protective effect of the intervention would persist. Finally, there could also be validity and definitional issues with the constructs used especially conflict, violence and attitudes towards them. It was not possible to validate the self reported incidents of violence.

## **5. CONCLUSIONS AND RECOMMENDATIONS**

The Mato-Oput 5 curriculum was effective in causing shifts in the children attitudes towards conflict and violence in favour of non-violent responses to provocation; however, no significant effect was detected on the pupil-perpetrated acts of violence. The children exposed to the curriculum were less likely to harbour negative attitudes towards conflict and violence compared to those who were not.

By demonstrating reductions in negative attitudes towards conflict and violence in children exposed to the Mato-Oput 5 curriculum, the study generated additional evidence in support of the potential for violence prevention in educational interventions - a key message in the World Report on Violence and Health<sup>8</sup>. It also identified a "candidate" intervention, that could be easily and cost effectively replicated in other similar settings: this intervention could be within the reach of many of the resource-constrained countries that are currently experiencing similar problems of youth violence.

The positive effect on attitudes makes the Mato-Oput 5 curriculum one of the promising interventions for the widespread problem of youth violence today. Subjecting children to it could reduce both the short and long term tendencies towards violence, since childhood aggression has been shown to be a good predictor of adolescent and early adulthood violence<sup>28</sup>: this will need to be developed further.

On the basis of the findings and limitations, a higher power study is recommended to conclusively determine the impact of the intervention on pupil perpetrated acts of violence. There is also need to investigate the long term effects of the curriculum on attitudes as well as violence, and to validate the instruments used for measuring attitudes. In the meantime, the Mato-Oput 5 curriculum remains a promising option for youth violence prevention.

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Map of Uganda showing the districts



**Injury and violence surveillance form**

1. Name of school.....	2. Pupil's name.....
3. Grade.....	4. Gender <input type="checkbox"/> Boy <input type="checkbox"/> Girl
6. Name of person filling the form.....	5. Age..... years
7. Occupation of person filling the form <input type="checkbox"/> Teacher <input type="checkbox"/> Pupil	
8. Date of incident.....	9. Time of incident.....
10. Date when form was filled.....	11. Time when form was filled.....

**12. Period when incident happened.**

- Before school
- Lunch time
- Physical education
- After school
- Break time
- General class
- Practical class
- Other.....

**13. Place where incident occurred.**

- Playground
- Farm/garden
- Classroom
- Unknown
- Road/street
- River/pond
- Laboratory
- Other.....

**14. Activity at the time of incident.**

- Classroom activity
- Walking
- Running (not in sport)
- Sport
- Fighting
- Other.....

**15. Intent of injury.**

- Unintentional
- Intentional
  - Self inflicted
  - Assault
- Undetermined

**16. Drug/alcohol use.**

- Alcohol use
  - Yes
  - No
  - Unknown
- Drug use
  - Yes
  - No
  - Unknown

**17. Body areas with injuries**

- None
- Face
- Arm & shoulder
- Wrist & hand
- Pelvis
- Foot
- Head
- Chest
- Spine
- Abdomen
- Thigh
- Leg
- Neck
- Forearm
- Other.....

**18. Type of injury**

- Non
- Fracture
- Head injury
- Unknown
- Cut
- Bite
- Bruise
- Other.....
- Crash
- Penetrating wound
- Sprain/strain

**19. What was the incident associated with?**

**(a) Social behaviour**

- Dodging class (truancy)
- Intimidation
- Sexual harassment
- Verbal abuse
- Alcohol use
- Cheating in exam
- Theft
- Pornography
- Class disruption
- Smoking
- Drugs
- Not applicable
- Other.....

**(b) Physical act.**

- Bullying
- Use of weapon
- Sport related
- Corporal punishment
- Collision with object
- Technical equipment related
- Sting/bite
- Not applicable
- Physical fight/assault
- Fall
- Vandalism
- Fire smoke inhalation
- Other.....

**20. Were the child's parents notified?**

- Yes
- No

**21. What kind of treatment did the child get?**

- No treatment
- Hospital/clinic
- Other.....
- School first aid
- Resuscitation on scene

**22. What was the outcome of the injury?**

- Recovered
- Unknown
- Died
- Other.....
- No injury

**23. How did incident affect kid's schooling?**

- Did not affect school attendance
- Missed school for..... days
- Dropped out of school
- Child was expelled

Supervisor.....  
Date.....

Quantitative evaluation of attitudes

I. Grade/Class .....	2. Age.....	3. Occupation. <input type="checkbox"/> Pupil <input type="checkbox"/> Teacher.
4. Gender: <input type="checkbox"/> Boy <input type="checkbox"/> Girl.	5. School:.....	

*Instruction: for each question circle the face which best to represents your opinion.*



1. My best colour is blue.



2. I like sugar cane so much.



3. If I catch some one stealing my sugar cane I will fight.



4. I feel bad each time I fight with someone.



5. It is wrong to fight with someone who abuses your parents.



6. If your father loves your mum, he should not beat her.



7. I want to be a footballer when I grow up.



8. A bully should be forgiven.



9. Quarrels between school children should be handled by the teachers.



10. A bully should be punished.



11. Girls should be made to uproot ant hills like the boys if they do wrong.



12. Latecomers should not be beaten.



13. Girls should not insult boys.



14. Boys should not touch girls' breasts.



15. If my friend steals my book and returns it, I shall forgive my friend.



16. If some one ambushes my friend, I will report him to the teacher.



17. The rebels who have killed people should not be allowed to come home.



18. I understand when my friends refuse to listen to my advice.



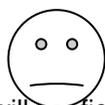
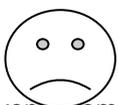
19. I don't mind when other pupils don't play with me.



20. Girls are less important than boys.



21. It is useful to send a girl to school.



22. Even if some one kicks me, I will not fight back.



23. If some one pinches me, I will try to get my bigger brother or sister to beat him or her.



24. If my friend abuses me I will forgive him or her.



25. If my friend tells a lie about me I will fight.



26. If my friend steals my pen I will fight.



27. I feel sad for a pupil who is beaten.



28. Young children should be protected from abduction.



29. I fought with someone this week.



30. I abused some one this week.



31. People who have a quarrel should solve it by force.



32 I feel good when I forgive my friend.



**UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG**

Division of the Deputy Registrar (Research)

**HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)**

R14/49 Milton

**CLEARANCE CERTIFICATE**

**PROTOCOL NUMBER M040815**

**PROJECT**

The Effectiveness of School Based Non-Violent Conflict Resolution Education in Preventing Youth Violence in Northern....

**INVESTIGATORS**

Mr M Milton

**DEPARTMENT**

School of Public Health

**DATE CONSIDERED**

04.08.27

**DECISION OF THE COMMITTEE\***  
further data collection will be done

Approved subject to written confirmation that no

**Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.**

**DATE** 04.08.30

**CHAIRPERSON** .....

  
(Professor PE Cleaton-Jones)

\*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Dr K Kahn

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**DECLARATION OF INVESTIGATOR(S)**

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.  
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES